

11-1952

## Supplement to Odor Report (1952)

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1952 SUPPLEMENT  
to  
SOME OBSERVATIONS ON ODOR INTENSITY  
in the  
LEWISTON-AUBURN AREA  
and  
COMPARISONS WITH OTHER DATA

by  
Walter A. Lawrence

Lewiston, Maine  
November, 1952

## SUMMARY

1. During the summer of 1952 the Androscoggin river odor had a somewhat higher average intensity than during the previous three years.
2. The odor experienced during the past ten summers places the years in order of decreasing odor intensity as 1944, 1947, 1943, 1946, 1945, 1948, 1952, 1949, 1951, and 1950.
3. The peak of the odor occurred during the three week period ending about August 17. Wide coverage of odor was recorded at station six on fifteen occasions.
4. Pollution load factors were lower than previous years, 1951 excepted. The average was 1.85 based on the flow at Gulf Island Dam.
5. Water temperatures, at times, were higher than any previously recorded. At the twenty foot depth at Gulf Island Dam sixty-five hours were recorded above 27°C (81°F) and three hundred and thirty-three hours above 26°C.

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to  
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LEWISTON-AUBURN AREA  
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Objectives. The objectives of this supplementary report are to:

- a. present the statistics for 1952 in the appropriate tables\* together with previously listed data; and
- b. record some of the analytical results and observations in geographical form to facilitate comparison with the data of other years.

Comparison of Odor Intensity Numbers 1943 to 1952 incl. The odor intensity numbers recorded at the downtown stations were low but were higher than any period since 1948. The highest odor average was obtained for the week ending August 14 but the two previous weeks were about the same. All three weeks were just below Odor Range two.

The data recorded in Tables 2, 3, and 3A are the basis for stating that the odor evaluations made during the past ten summers places the years, in order of decreasing intensity, as 1944, 1947, 1943, 1946, 1945, 1948, 1952, 1949, 1951, and 1950. There was very little difference in the odor intensity for the years 1949 through 1951.

\*Where possible the numbers of the Tables in this supplement are identical with comparable Tables presented in the original Report of November 1946.

TABLE #2

## ODOR INTENSITY DURATION

Weeks in each Range.

	1952	1951	1950	1949	1948	1947	1946	1945	1944	1943
Range 1	16	15	15	15	14	7	7	10	4	5
Range 2	0	0	0	0	1	4	3	3	3	4
Range 3	0	0	0	0	0	2	5	3	5	7
Range 4	0	0	0	0	0	3	0	0	4	0
TOTAL Weeks	16	15	15	15	15	16	15	16	16	16

Although there are no weeks recorded in Range two for 1952 the three weeks ending July 31, August 7 and 14 had averages very close to the lowest limit of that range.

TABLE #3A

## AVERAGE MONTHLY

## ODOR INTENSITY NUMBERS

	1952	1951	1950	1949	1948	1947	1946	1945	1944	1943
June	16*	14*	20*	29*	24*	24	35*	33	42	45
July	28	22	28	28	38	32	50	33	42	55
August	38	30	25	28	32	56	47	47	66	44
September	25**	20	15	18	30	49	56	35	48	42

\*Two weeks; other Junes three weeks

\*\*Five weeks.

The average monthly intensity number for June 1952 was very favorable. The July average although higher than that for 1951 was exactly the same as that for July 1950 and 1949. The odor average for August 1952 was higher than any August since 1947; the September average exceeded any September since 1948.

TABLE #3

COMPARISON of ODOR  
INTENSITY NUMBERS.

1943-1952 Inclusive

	Date											Intensity										
	43	44	45	46	47	48	49	50	51	52		43	44	45	46	47	48	49	50	51	52	
June	17	15	14	13	12	17	16	15	14	12		50	59	29	--	--	--	--	--	--	--	
	24	22	21	20	19	24	23	22	21	19		44	45	35	30	23	18	28	15	13	13	
	1	29	28	27	26	1	30	29	28	26		41	43	34	40	24	29	30	25	15	18	
July	8	6	5	4	3	8	7	6	5	3		58	27	27	49	29	33	31	34	24	21	
	15	13	12	11	10	15	14	13	12	10		56	33	30	57	19	41	25	23	23	26	
	22	20	19	18	17	22	21	20	19	17		49	51	36	51	28	42	26	23	20	23	
	29	27	26	25	24	29	28	27	26	24		47	55	37	41	35	33	28	30	28	30	
Aug.	5	3	2	1	31	5	4	3	2	31		50	79	42	56	48	37	24	25	26	40	
	12	10	9	8	7	12	11	10	9	17		40	69	49	52	41	41	27	25	32	38	
	19	17	16	15	14	14	18	17	16	14		40	62	50	46	53	34	30	23	27	41	
	26	24	23	22	21	26	25	24	23	21		42	68	49	39	65	25	29	24	29	35	
	2	31	30	29	28	2	1	31	30	28		49	52	46	45	69	27	29	27	34	37	
Sept.	9	7	6	5	4	9	8	7	6	4		52	55	37	38	65	30	14	23	27	24	
	16	14	13	12	11	16	15	14	13	11		43	56	45	22	49	35	12	12	19	25	
	23	21	20	19	18	23	22	21	20	18		40	42	32	40	42	30	21	15	13	24	
	30	28	27	26	25	30	29	28	27	25		31	37	24	45	48	23	12	9	21	27	
Oct.					2					2						42					26	

1943 1944 1945 1946 1947 1948 1949 1950 1951 1952

Total of Intensity Numbers	732	813	602	651	680	483	366	333	345	448
Number of weeks	16	16	16	15	16	15	15	15	15	16
Average weekly Intensity Number	46	51	38	43	43	32	24	22	23	28
Maximum weekly Intensity Number	58	79	59	57	69	43	31	34	34	41
				56		41				
						41				

Maximum odor down- 7/8 8/3 8/16 7/11 8/28 7/22 \* 7/6\*\*8/30 8/14  
town during week 8/1 7/15  
ending 8/12

\*Statistically, July 7, but not materially different from some other weeks.

\*\*Not significant

47

Pollution Load Factors.\* The pollution factors, tons of sulphite pulp per million cubic feet of river water, recorded in Tables P.L.F. #1 and #2 were determined on a weekly basis correcting for the time of passage to Gulf Island Dam. The factors are only approximate. For sodium nitrate control the Rumford Guage yields a better standard.

During the 1952 control period the pollution load factor calculated on Gulf Island flows, averaged 1.85. This load factor proved to be too high for the unusual atmospheric conditions which prevailed from July through September, and at times resulted in a somewhat less favorable odor condition-in the Pool and in the region of the Dams.

\*For more detailed information turn to the sodium nitrate section of this report.

TABLE P.L.F. #1  
Pollution Load Factor  
(Season average at Gulf Island Dam)

Year	Period	P.L.F.
1943	July 1 to Sept. 16	1.90
1944	June 15 to Sept. 28	2.60
1945	June 14 to Sept. 27	2.09
1946	June 13 to Sept. 26	2.38
1947	June 19 to Oct. 2	2.07
1948	June 17 to Sept. 30	2.03
1949	June 16 to Sept. 29	1.88*
1950	June 16 to Sept. 17	1.90**
1951	June 18 to Sept. 16	1.75**
1952	June 19 to Sept. 30	1.85**

\* Does not include International Paper Company pollution load.

\*\* Includes International Paper Company pollution load.

TABLE P.L.F. #2

## 1952 Weekly Pollution Factors

Week Ending	Aver. c.f.s.*	M.C.F. per week	Compens. Production Tons*	P.L.F. (T/M.C.F.)
June 22	(3954)	(2391)	(3479)	(1.45)
29	3543	2143	2824	1.31
July 6	2624	1587	2616	1.65
13	2350	1421	2251	1.58
20	2127	1286	1454	1.16
27	2007	1214	1942	1.60
Aug. 3	1936	1171	2114	1.80
10	1833	1109	2444	2.20
17	1991	1204	2299	1.91
24	2018	1220	2377	1.93
31	1816	1098	2231	2.02
Sept. 7	2138	1293	2154	1.67
14	1743	1054	2098	1.99
21	1754	1061	2096	1.97
28	1736	1050	2330	2.21
Oct. 5	1994	1206	2238	1.85
12	1924	1165	2293	1.97
Average June 29 to Oct. 12	2000	1210	2235	1.85

\*Based on Gulf Island Dam flows and dates.



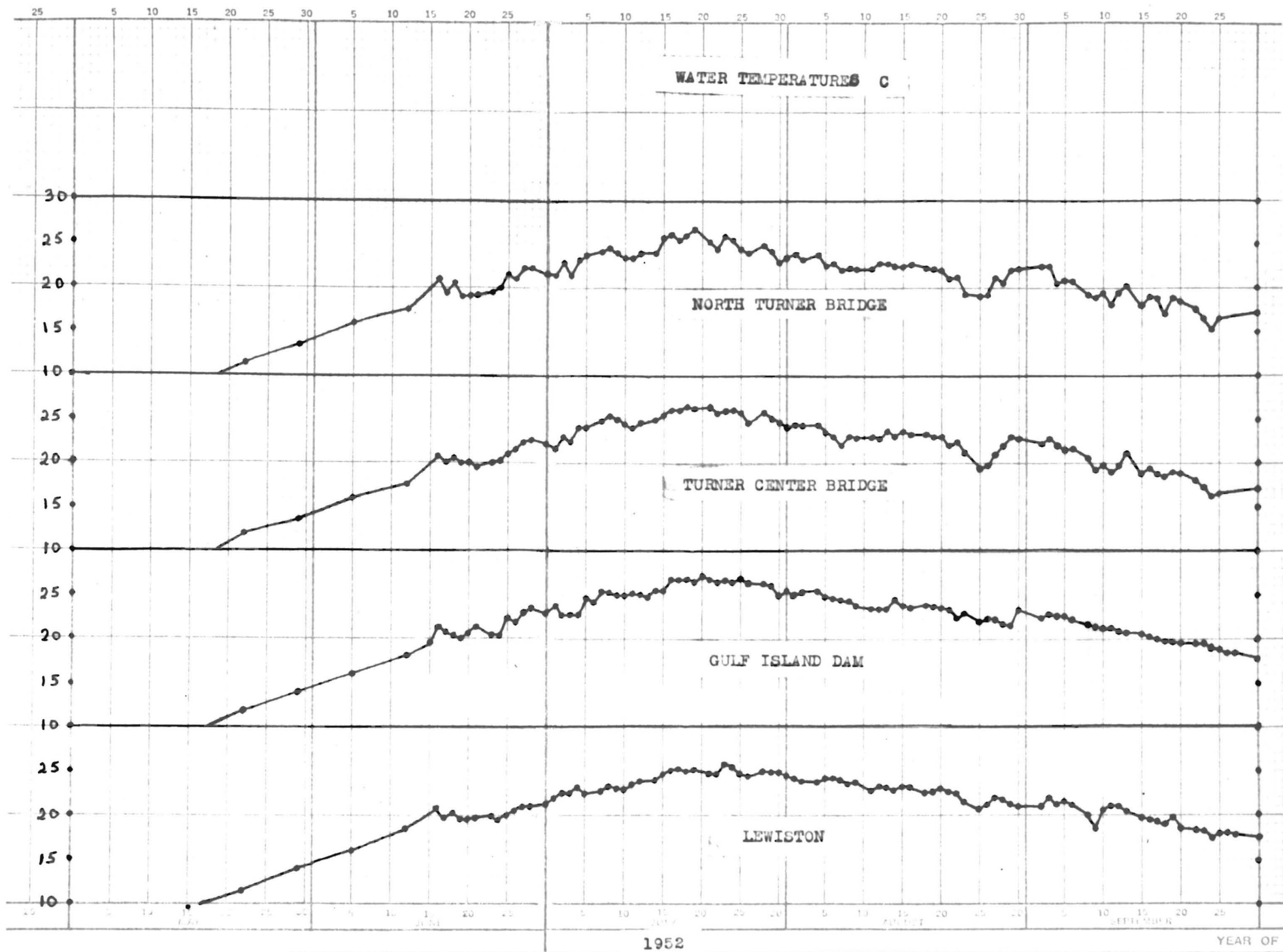
TABLE T.1  
WATER TEMPERATURES

GULF ISLAND DAM Monthly Averages*					
Year	May	June	July	August	September
1952**	10.4	18.6	24.1	22.9	20.0
1951**	13.6	19.5	23.0	23.1	20.0
1950**	12.7	20.3	23.3	22.4	17.2
1949	16.0	20.3	24.0	24.5	20.0
1948	10.6	18.5	24.2	24.7	21.4
1947	10.6	16.6	25.2	25.6	22.3
1946	13.0	20.8	25.5	22.5	20.9
1945	11.4	18.2	23.5	23.8	20.4
1944	11.6	20.7	24.4	24.6	19.8
1943	10.8	19.5	23.6	22.4	18.0
(1942)	( - )	( - )	(23.6)	(24.0)	(20.0)
Ten Year Average	12.18	19.3	24.1	23.6	20.0
1952 comp. with Aver.-1.17	-1.17	-0.7	0.0	-0.7	0.0

\*\*at twenty foot depth; all others about five foot depth.

\*Based on the Thursday reports.

Water Temperatures. Some of the water temperatures recorded during this summer were the highest obtained since observations were begun in 1943. On July 26 at 3:00P.M. the recording thermometer at Gulf Island Dam went "off scale" at 28°C and remained in that position for several hours. Comparison with the ten year average is some what misleading due to the difference in depth at which the first seven year readings were made. The earlier readings made at shallower depths are probably one to one and one-half degrees higher during July and August, than the twenty foot recordings.



# RECORDED WATER TEMPERATURES

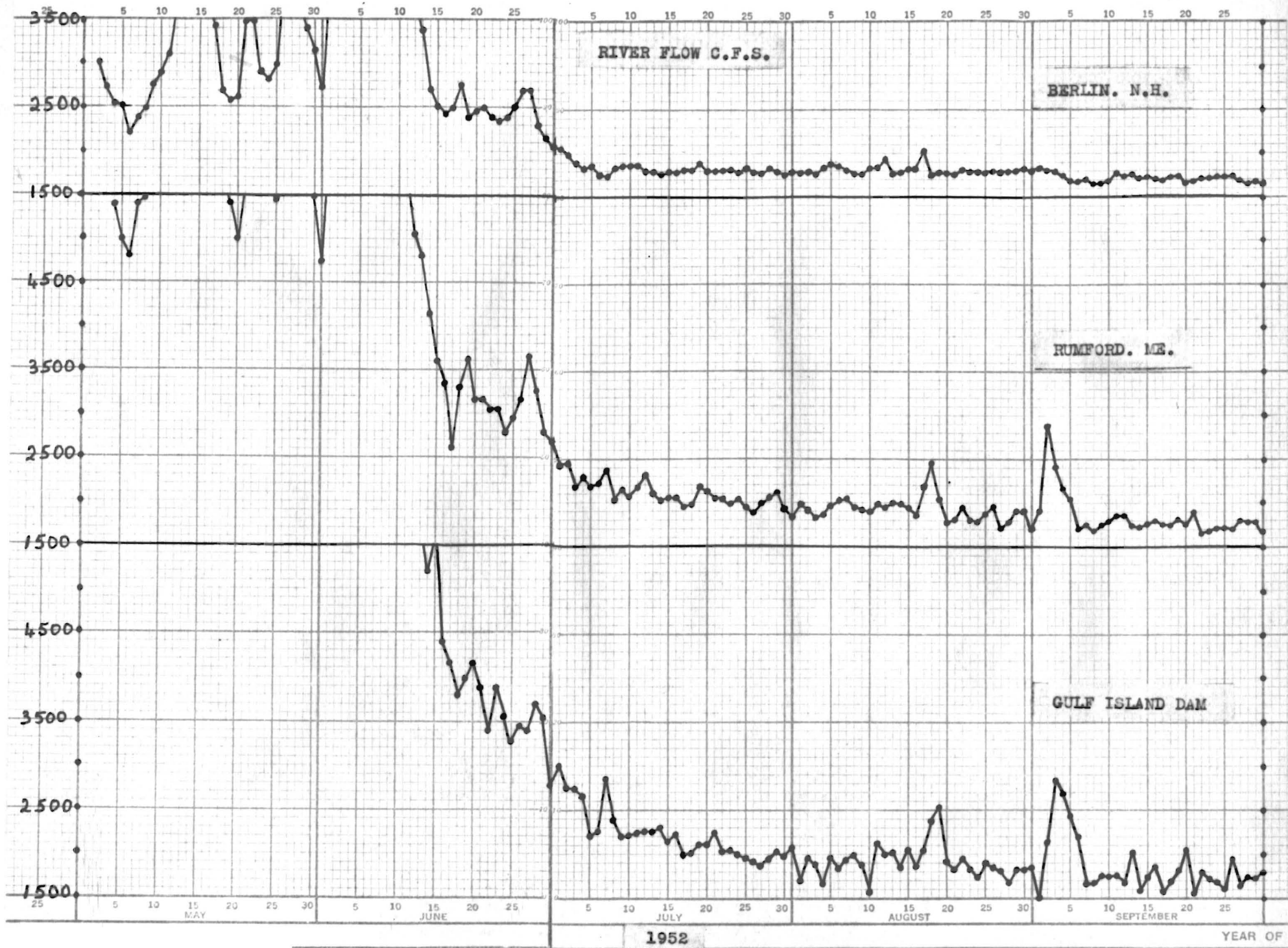
Gulf Island Dam 1952

Depth twenty feet

Temperatures above 27°C				Duration hours	
Date	time	to	Date	time	
July 16	1230		July 17	0300	14.5
17	1000		17	2200	12.0
19	1730		19	2000	2.5
20	0630		20	1500	8.5
20	2100		20	2300	2.0
22	1800		22	2000	2.0
22	2100		22	2330	2.5
24	1000		24	2300	13.0
25	1200		25	2000	8.0
					<u>65.0</u>

Temperatures 26°-27°					
July 13	1700		July 13	2000	3.0
16	0900		16	1230	3.5
17	0300		17	1000	7.0
17	2200		19	1730	43.5
19	2000		20	0630	10.5
20	1500		22	2100	6.0
20	2300		22	1800	43.0
22	2000		22	2100	1.0
22	2330		24	1000	34.5
24	2300		25	1200	13.0
25	2000		30	0300	103.0
					<u>258.0</u>

Temperatures 25°-26°					
July 7	0630		July 7	1530	9.0
7	1900		7	2200	3.0
8	0600		8	1500	9.0
8	2100		8	2200	1.0
9	0930		9	2130	12.0
9	2230		9	2330	1.0
10	0200		12	1500	61.0
12	1600		12	2030	4.5
13	1000		13	1700	7.0
13	2000		15	0200	30.0
15	0330		16	0900	29.5
30	0300		Aug. 4	1200	129.0
					<u>296.0</u>



River Flows. River flows were very satisfactory until about the end of the first week of July. From then until the end of the control period the flow slowly decreased and there were no upsurges due to the very low precipitation. The Gulf Island Dam average from June 22 to October 12 was approximately 2000 c.f.s. This average, however, is distorted by the comparatively high flows for the first two weeks of the period. The September average was 1843 c.f.s.

1952 Summary. Water temperatures in the river and Pool were very high. Owing to the unusually scant precipitation flows were much below average during August and September. River odor intensities at the down-town stations were usually low but averaged higher than those of the past three years. Odor from the Pool and Dams was recorded at Station #6 on fifteen different occasions. For the first time in four years hydrogen sulfide was at times present, in low concentration, in the water flowing through the canal system.

## Androscoggin River Flows

C.F.S.

May 1952

Date	Berlin	Rumford	Gulf Island Dam
1	4092	9860	13830
2	3021	7610	11010
3	2728	5680	9150
4	2534	5380	7990
5	2517	5000	7180
6	2215	4800	6580
7	2365	5430	6280
8	2483	5470	6830
9	2754	5920	6970
10	2882	6380	7290
11	3094	6190	7920
12	4708	17090	11420
13	5873	17590	29050
14	5018	11540	20730
15	3692	8870	13980
16	3583	8960	11750
17	3433	7930	12250
18	2689	6270	10560
19	2562	5390	8650
20	2613	5000	7330
21	3474	8440	8090
22	3487	8680	12480
23	2885	7150	10830
24	2810	5700	8900
25	2966	5440	8180
26	4205	7980	8070
27	4544	8550	10800
28	4178	7200	10230
29	3382	6140	8670
30	3147	5510	8100
31	2734	4740	7100

# Androscoggin River Flows

C.F.S.

June 1952

Date	Berlin	Rumford	Gulf Island Dam
1	3913	9420	6800
2	9603	26040	21660
3	10063	18600	30360
4	9870	14920	20780
5	10102	14460	17280
6	8005	13170	16600
7	6953	10670	15060
8	6611	9670	12940
9	5727	8440	11220
10	4483	7000	10260
11	3714	5790	8240
12	3606	5060	6750
13	3383	4820	6030
14	2704	4150	5190
15	2512	3590	5640
16	2441	3350	4370
17	2476	2610	4150
18	2755	3310	3770
19	2387	3620	3970
20	2438	3160	4140
21	2481	3160	3870
22	2388	3050	3410
23	2337	3060	3880
24	2383	2790	3550
25	2494	2960	3270
26	2677	3140	3460
27	2675	3650	3400
28	2288	3240	3700
29	2161	2770	3540
30	2060	2690	2780

# Androscoggin River Flows

C.F.S.

July 1952

Date	Berlin	Rumford	Gulf Island Dam
1	2061	2430	3010
2	1985	2450	2740
3	1886	2190	2730
4	1834	2290	2640
5	1857	2180	2210
6	1757	2220	2260
7	1738	2370	2850
8	1818	2030	2380
9	1853	2140	2200
10	1867	2070	2220
11	1888	2170	2240
12	1791	2320	2270
13	1780	2110	2260
14	1761	2030	2300
15	1784	2060	2150
16	1787	2060	2220
17	1815	1940	1990
18	1813	1970	2010
19	1883	2180	2110
20	1801	2130	2110
21	1800	2040	2240
22	1817	2040	2030
23	1817	1990	2040
24	1786	2030	2000
25	1832	1940	1960
26	1792	1880	1910
27	1766	1990	1870
28	1821	2060	1940
29	1792	2110	2020
30	1746	1930	1980
31	1778	1840	2070



# Androscoggin River Flows

C.F.S.

August 1952

Date	Berlin	Rumford	Gulf Island Dam
1	1774	1980	1700
2	1791	1910	1950
3	1761	1820	1890
4	1833	1860	1670
5	1874	1960	1960
6	1861	2010	1830
7	1805	2040	1930
8	1769	1950	1990
9	1767	1910	1880
10	1825	1900	1570
11	1836	1990	2110
12	1923	1940	2000
13	1770	2000	20 20
14	1784	1990	1850
15	1811	1940	2050
16	1816	1860	1870
17	2031	2190	2040
18	1752	2460	2380
19	1779	2030	2530
20	1774	1780	1910
21	1758	1810	1820
22	1809	1940	1940
23	1784	1810	1820
24	1781	1790	1730
25	1774	1880	1900
26	1796	1960	1850
27	1784	1710	1810
28	1790	1780	1870
29	1806	1910	1820
30	1825	1910	1820
31	1803	1710	1840

# Androscoggin River Flows

C.F.S.

September 1952

Date	Berlin	Rumford	Gulf Island Dam
1	1832	1910	1500
2	1807	2880	2140
3	1791	2420	2840
4	1744	2170	2690
5	1691	2040	1930
6	1692	1710	2200
7	1701	1750	1670
8	1654	1690	1680
9	1662	1760	1750
10	1691	1790	1740
11	1774	1860	1750
12	1734	1860	1680
13	1748	1740	2010
14	1710	1720	1590
15	1722	1770	1730
16	1703	1800	1860
17	1693	1780	1580
18	1714	1740	1700
19	1729	1810	1820
20	1658	1760	2050
21	1679	1900	1540
22	1704	1650	1800
23	1706	1680	1720
24	1728	1710	1690
25	1726	1710	1610
26	1733	1700	1950
27	1689	1800	1640
28	1642	1780	1740
29	1677	1780	1720
30	1658	1670	1800

Androsoggin River Flows

C.F.S.

October 1952

Date	Berlin	Rumford	Gulf Island Dam
1	1614	1740	1490
2	1654	1680	1830
3	1718	2240	1900
4	1708	2330	2580
5	1609	2230	2640
6	1598	1750	2240
7	1610	2000	2140
8	1598	1720	1960
9	1606	1720	1790
10	1574	1680	1740
11	1550	1730	1860
12	1477	1580	1740

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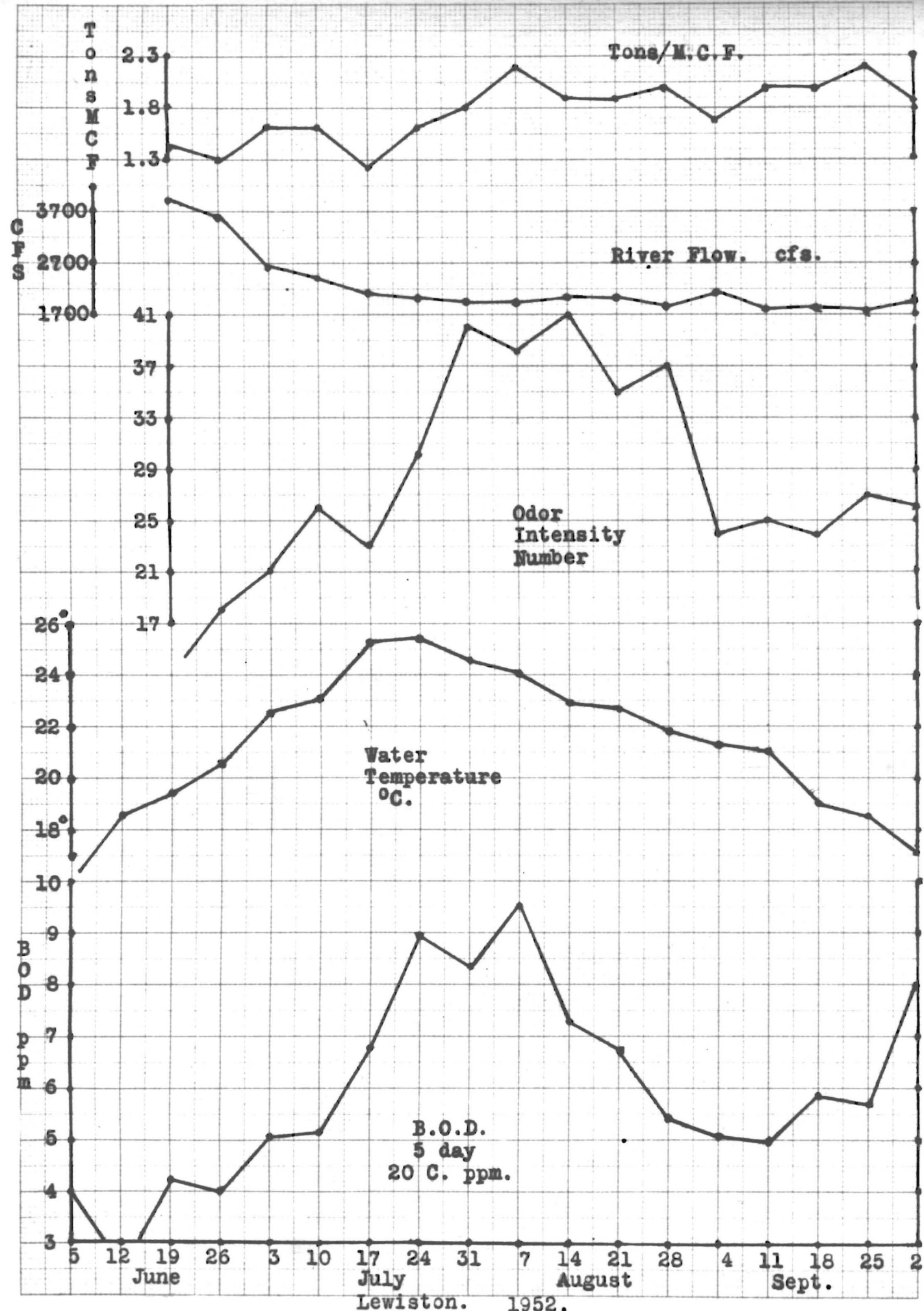


TABLE #8

LEWISTON, MAINE, 1952

Date (Thursday)	Water Temp. C.	B.O.D. 5 day p.p.m.	Odor Intens. Number**	River Flow* c.f.s.	Compens. Tons per M.C.F.*
June 5	16.0	4.00	-		
12	18.5	2.40	-	7619	
19	19.5	4.17	13	3954	1.45
26	20.5	4.00	18	3543	1.31
July 3	22.5	5.06	21	2624	1.65
10	23.0	5.16	26	2350	1.58
17	25.2	6.77	23	2127	1.16
24	25.4	8.92	30	2007	1.60
31	24.5	8.35	40	1936	1.80
Aug. 7	24.0	9.52	39	1833	2.20
14	22.9	7.32	41	1991	1.91
21	22.7	6.74	35	2018	1.93
28	21.8	5.39	37	1816	2.02
Sept. 4	21.2	5.09	24	2138	1.67
11	21.0	4.98	25	1743	1.99
18	19.0	5.85	24	1754	1.97
25	18.5	5.73	27	1736	2.21
Oct. 2	17.0	7.95	26	1994	1.85

\* Week ending 7:00 a.m. Monday; Gulf Island Gauge

\*\* Weekly average to Thursday

Hydrogen Sulfide. This summer hydrogen sulphide was present, usually in small amounts in the water flowing through the canal system. Analyses indicate that the concentration in the water at Gulf Island Dam was higher this year than last with approximately the same pollution load. The analytical data are recorded elsewhere in this report.